

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

RECEIVED
CENTRAL FAX CENTER

OCT 15 2007

LISTING OF CLAIMS:

The following listing of claims replaces all previous, and listings, of claims in the present application.

Please cancel claims 9, 10, 17, 18, and 22-28 without prejudice or disclaimer, add new claims 29-32, and amend claims 1, 4, 6, 7, 12, 14 as follows.

1. (Currently amended) A circuit board having a flat plate shaped first board part and a flat plate shaped second board part disposed stacked on a partial region of this first board part, said circuit board characterized in that

 said first board part and said second board part each comprise a substrate formed in a flat plate shape, a plurality of interconnection patterns arranged inside said substrate so as to form a plurality of layers in its thickness direction, and a plurality of interlayer connection parts disposed inside said substrate for connecting interconnection patterns belonging to different layers,

 at least one of the substrate of said first board part and the substrate of said second board part [[is]] comprises a thermoplastic resin substrate made only of a thermoplastic resin,

 said first board part and said second board part are joined at their respective stacked regions by the thermoplastic resin, being melted and then rehardened,

 a plurality of first interconnection patterns are disposed on said stacked region of said first board part,

 a plurality of second interconnection patterns are disposed on said stacked region of said second board part so as to form pairs with said plurality of first interconnection patterns, and

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

between the pairs of said first interconnection patterns and said second interconnection patterns, interboard connection parts are formed from a connection material which at a temperature applied to melt the thermoplastic resin melts at least partially and electrically connects the first and second interconnection patterns together.

2. (Original) A circuit board according to claim 1, characterized in that a part of said second board part is stacked on said first board part.

3. (Original) A circuit board according to claim 1, characterized in that said second board part is more pliable than said first board part.

4. (Currently amended) A circuit board according to claim 1, characterized in that the substrate of said first board part and the substrate of said second board part are each made of [[a]] the thermoplastic resin.

5. (Original) A circuit board according to claim 4, characterized in that the substrate of said first board part and the substrate of said second board part are made of an identical thermoplastic resin.

6. (Currently amended). A circuit board according to claim 1, characterized in that of said first board part and said second board part, said interlayer connection parts of the board part having the thermoplastic resin substrate made only of the thermoplastic resin a thermoplastic

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

~~resin as its substrate and said interboard connection parts are made from the same connection material, and the connection material constituting the interboard connection parts is connected to the first and second interconnection patterns by a metal diffusion junction.~~

7. (Currently amended) A circuit board according to claim 6, characterized in that said connection material includes tin and silver as main components, the first and second interconnection patterns include copper, and the tin of the connection material and the copper of the first and second interconnection patterns are solid-phase diffused into each other to form interfaces therebetween.

8. (Original) A circuit board according to claim 6, characterized in that, of said first board part and said second board part, the interboard connection parts belong to the board part having a thermoplastic resin as its substrate.

9-10. (canceled)

11. (Original) A circuit board according to claim 1, characterized in that said first and second interconnection patterns are arranged so as to form at least two rows.

12. (Currently amended) ~~A circuit board according to claim 1, characterized in that A circuit board having a flat plate shaped first board part and a flat plate shaped second board part~~

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

disposed stacked on a partial region of this first board part, said circuit board characterized in that

said first board part and said second board part each comprise a substrate formed in a flat plate shape, a plurality of interconnection patterns arranged inside said substrate so as to form a plurality of layers in its thickness direction, and a plurality of interlayer connection parts disposed inside said substrate for connecting interconnection patterns belonging to different layers.

at least one of the substrate of said first board part and the substrate of said second board part is made of a thermoplastic resin.

said first board part and said second board part are joined at their respective stacked regions by the thermoplastic resin being melted and then rehardened.

a plurality of first interconnection patterns are disposed on said stacked region of said first board part,

a plurality of second interconnection patterns are disposed on said stacked region of said second board part so as to form pairs with said plurality of first interconnection patterns,

between the pairs of said first interconnection patterns and said second interconnection patterns, interboard connection parts are formed from a connection material which at a temperature applied to melt the thermoplastic resin melts at least partially and electrically connects the first and second interconnection patterns together, and

of said first board part and said second board part, the board part having a thermoplastic resin as its substrate has the stacked region and a non-stacked region which is not stacked on the

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

other board part, and in the stacked region a trace resulting from a greater number of meltings and rehardenings than the non-stacked region is left.

13. (Original) A circuit board according to claim 12, characterized in that as said trace, a mark resulting from pressing said thermoplastic resin remains in said stacked region.

14. (Currently amended) A circuit board connection structure for connecting, a first circuit board in which a thermoplastic resin is used as an insulating material to a second circuit board serving as a mother board, characterized in that

 said first circuit board has a multilayer structure wherein insulating layers made only from a thermoplastic resin and interconnection layers are stacked alternately and to electrically connect adjacent interconnection layers together an interlayer connection material is disposed in said insulating layers,

 in an insulating layer being made only from the thermoplastic resin and constituting a connection face of said first circuit board to be connected to said second circuit board, via holes reaching the inner interconnection layers are formed, and these via holes are filled with a connection material,

 said second circuit board has a multilayer structure wherein insulating layers and interconnection layers are stacked alternately and an interlayer connection material for electrically connecting adjacent interconnection layers together is disposed in said insulating layers,

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

at least lands serving as connection terminals are formed on a connection face of said second circuit board, and inner interconnection layers are used for interconnecting to those lands, and

said first circuit board is connected to said second circuit board by said connection material of the first circuit board being electrically connected to the lands of said second circuit board and the insulating layer constituting the connection face of said first circuit board being adhered to the connection face of said second circuit board by thermal welding.

15. (Original) A circuit board connection structure according to claim 14, characterized in that when the insulating layers of said second circuit board are made from a thermoplastic resin, as the thermoplastic resin constituting the insulating layers of the first board, a thermoplastic resin material having a lower melting point than the thermoplastic resin constituting the insulating layers of said second circuit board is used.

16. (Original) A circuit board connection structure according to claim 14, characterized in that said connection material includes at least a tin component and a metal component with a higher melting point than the tin component, and is electrically connected to the lands of said second circuit board by the tin component diffusing into the lands.

17-18. (canceled)

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

19. (Original) A circuit board connection structure according to claim 14, characterized in that said lands are arranged two-dimensionally on the connection face of said second circuit board.

20. (Original) A circuit board connection structure according to claim 14, characterized in that a surface roughening treatment is carried out on at least one of the connection faces of said first circuit board and said second circuit board, to increase bonding strength.

21. (Original) A circuit board connection structure according to claim 20, characterized in that said surface roughening treatment is carried out by irradiating the connection face with ultraviolet (UV) light.

22-28. (canceled)

29. (New) A circuit board according to claim 1, characterized in that said first board part and said second board part are joined using an adhesive character of the thermoplastic resin of the thermoplastic resin substrate.

30. (New) A circuit board according to claim 1, wherein the thermoplastic resin substrate of the first board part functions as an insulator.

Serial No. 10/769,763

Attorney Docket No. 01-503-TB

31. (New) A circuit board according to claim 1, wherein the thermoplastic resin substrate of the second board part functions as an insulator.

32. (New) A circuit board according to claim 4, characterized in that the thermoplastic resin of said first board part has a lower melting point than the thermoplastic resin constituting said second board part.